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Traditional Practices and Beliefs Regarding Infant Care in Pakistan

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Abstract

Introduction: The infant mortality rate in Pakistan is still relatively high. One of the factors associated with a high infant mortality rate is the lack of evidence-based health care practices in Pakistan. Non evidence based traditional practices may be associated with poor health outcomes. This study explores a few traditional practices and associated factors regarding infant care among mothers of infants in Karachi, Pakistan.

Methodology: This survey was conducted in family medicine clinics at Liaquat National Hospital, Karachi, and its outreach service centers. Data were collected by family physicians from mothers of infants visiting for well-baby and vaccination clinics, through a piloted questionnaire. 248 questionnaires were filled, entered, and analyzed on SPSS version 23. Ethical approval was taken from the Institutional Review Committee.

Results: Around 42% of mothers bathed the child immediately after birth at home. 37% of mothers gave water besides breastfeeding in the first 6 months while 30% gave top feed. 50% put the child to sleep in a prone position while 75% of the mothers tried to shape the child's head. Among them, 29% said that shaping the head helps in brain development. 63% of mothers discarded their first milk (colostrum). Delayed neck holding was significantly high in infants whose mothers discarded their colostrum (p=0.030) and who were put to sleep in the prone position (p=0.018). Allergies were found to be high among non-immunized children (p=0.019) and low birth weight infants (p=0.033). Allergies and chest infections were more common among infants who were put to sleep in a cradle (p=0.032 and p=0.001).

Conclusion: This study determined certain unique and possibly risky practices of mothers and their families regarding the health care of their infants. Health awareness during the ante-natal period and well-baby clinics need to be given by nurses and doctors to prevent harm to the child with non-evidence-based practices.

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Introduction

Infant Mortality Rate (IMR) is high in South Asian countries and accounts for 39% of neonatal deaths globally, with the highest mortality rate in Pakistan and India in this region [1]. In Pakistan, UNICEF has reported an estimated IMR of 57.2 per 1000 live births in 2018 [2]. Although the IMR has considerably decreased in the last three decades from 90 to 57 per 1000 live births still more than 30 million infants die annually before completing their first year of life; a rate which is eight times higher than in European countries [3]. The first month of birth is the most crucial period for child survival as 47% of under-five mortalities in 2017 occurred during the neonatal period [4]. Therefore addressing health care issues during infancy to reduce morbidity and mortality is a priority.

Infectious diseases continue to be a significant cause of neonatal and infant mortality even in developed countries [5]. Neonatal and infant health care practices to prevent infections and maintain wellbeing vary across different civilizations and cultures. In many countries like South Asian countries, various traditional practices are still being followed to care for neonates and infants. It is already known that lack of evidence-based practices especially among mothers in Pakistan could be one of the significant factors contributing to higher mortality among this age group. For example, the majority of mothers have sub-optimal breastfeeding practices [6]. Pre-lactic feeding, late initiation of breastfeeding, discarding the colostrum, and supplemental feeding in the first 6 months are still being followed as traditional practices among many parts of the developed and developing world, without informing the primary care physician about such practices [7,8].

Besides feeding practices, other newborn healthcare practices may or may not be evidence-based and often hazardous. A few examples commonly seen in low socio-economic strata are bathing the newborn immediately after birth at home, application of home-made substances on the umbilical stump for fast healing, and massaging the baby; practices which may impose a risk of hypothermia and sepsis [9].

During infancy, effective child-rearing practices and parenting are important for the growth and development of the child which are influenced by traditional norms and beliefs. Giving shape to the nose and skull through different means and wrapping the child tightly to promote growth and to prevent excessive crying are few examples of such beliefs [10]. A few of these non-evidence-based practices may be harmful and hence recommendations may be made to create awareness regarding the untoward consequences these practices.

Hence this survey explores the cultural beliefs and practices among mothers in Pakistan regarding their infants' health and wellbeing. It also determines the perception of mothers about these practices and their association with developmental outcomes. Moreover, the association between socio-demographic factors, infant health, and practices were assessed. This study would enable to design culturally acceptable health awareness programs to modify the risky beliefs and practices and to measure the effectiveness of those interventions.

Methodology

After approval from the ethical review committee of Liaquat National Hospital and Medical College (Dated 19-04-2017), this cross-sectional study was conducted from October 2018 to December 2019 in family medicine clinics of Liaquat National Hospital at the main campus (stadium road) and five outreach centers (Nazimabad, Shahfaisal, Gulistan e Jauhar, Gulshan, and Naseerabad) located in Karachi. Mothers of infants (upto one year of age) visiting family medicine clinics for well-baby clinics and vaccination during the study period were invited for participation.

A previous study reported the use of supplementary feeds among 71.3% of neonates [9]. With a precision level of 6% and a confidence interval of 95%, a sample of 219 was calculated through the World Health Organization (WHO) software. On account for non-participation, 250 parents were approached. Among those, 248 participants consented and were surveyed through a structured questionnaire filled by female doctors. Privacy and confidentiality were maintained during the interview. Infants accompanied by family members other than mothers, infants with congenital disorders interfering with their growth or development, and with physical deformities were excluded. The collected data were analyzed using IBM SPSS (version 20). Categorical variables were reported as frequency and percentages. Continuous variables were presented as mean ± standard deviation or median (inter-quartile range) as appropriate. Chi-square or Fisher's exact test was applied to determine the association of maternal practices and neonatal outcomes with infant's developmental indicators including infant neck holding and sitting. A two-tailed p-value of < 0.05 was considered significant.

Results

Among 250 participants approached, 248 (99.2%) mothers of infants participated in the study. Maternal socio-demographic characteristics are depicted in Table 1. The median age of the mother was 26 years (IQR =23.25-31) (range 18 - 45 years). All participating mothers had less than or equal to five children while 11% reported a history of infant death in their offspring. Regarding literacy, almost half of the participants were graduate or post-graduate. Only 17 (6.9%) mothers were professionals while remaining were housewives. More than half of the mothers reported that the last delivery was vaginal. 84% delivered their child in the hospital, 7% from a traditional birth attendant and 8% of the deliveries were performed by their female relatives.

Maternal practices regarding infant care are demonstrated in Table 1. Almost two-thirds of the mothers reported that their infant was currently breastfeeding. Those who were not breastfeeding, more than half did not specify any reason while almost a third said that they were unable to feed their babies due to various reasons. More than one-fourth of the mothers gave other food besides milk during the first 6 months on infant birth. On exploring the type of diet that was given, 45.9% reported that they gave cereal diet and 28.4% gave another soft diet including fruits (14.9%), porridge (1.4%), and yogurt (1.4%). On further inquiring about the reason to give other diets in the first six months, the majority of the mothers shared that they wanted their children to gain weight (47.3%). The practice of discarding colostrum was reported by 63.3% mothers and all of them perceived it as "bad" for the newborn. A quarter of the mothers (26.2%) used different chemicals (other than alcohol) on the umbilical cord of the newborn. Almost half of the mothers gave a bath to the child immediately after birth. Nearly half of the mothers reported that they tightly wrap their babies and 21.4% followed this practice with the belief that it would be helpful for children to be put to sleep. 216 (87.1%) women regularly gave body massage to their infants and 61.1% of them

believed that it is useful in enhancing sleep. 1.4% were giving a massage without knowing any benefits. More than half of the mothers (52.9%) put their children to sleep in the prone position.

Details of neonatal outcomes are summarized in Table 1. Among all infants, 72% were full term-born and 27% were preterm. According to the mothers, 55% had normal birth weight while 25% of infants were born with low birth weight. The mean age of infants was 8.6 months while mean weight and height were 7 kg and 56 cm respectively. 36% of infants were completely immunized according to the extended program of immunization. History of allergies, chest infections, and diarrheal diseases was positive in 27%, 44.4%, and 38.7% infants respectively. Delay in neck holding was seen in 17.3% of infants while a delay in sitting without support was reported by 12.9% mothers.

Table 1: Maternal socio-demographic characteristics, their belief and practices regarding infant care and neonatal outcomes.

Maternal socio-demographic characteristics	
Variables	**Frequency (%)**
Education Level	
Illiterate	31 (12.5)
Madrassa	18 (7.3)
Primary	41 (16.5)
Secondary	53 (21.4)
Graduation/ Post graduation	105 (42.3)
Maternal occupation	
Housewife	231(93.1)
Health worker	6(2.4)
Teachers	11(4.4)
Last delivery mode	
Normal	164(66.1)
Assisted	9(3.6)
C-section	75(30.2)
How the child was delivered?	
Traditional birth attendant	19(7.7)
Hospital	209(84.3)
Female relatives	20(8.1)
Maternal beliefs and practices regarding infant care	
Breastfeeding practices	
Currently on breastfeeding	
Yes	172 (69.4)
No	76 (30.6)
If not breastfed why?	
The child was unable to breastfeed	9 (3.6)
Mother was unable to feed	23 (9.3)
Top feed help the baby to gain weight quickly	3 (1.2)
No reason specified	41 (53.9%)
Feeding practices	
Any other feed beside milk in the first 6 months	
Yes	74 (29.8)
No	174 (70.2)
If yes, specify	
Cereal diet	34 (45.9)
Soft food	21 (28.4)
Top feed	15 (20.3)
Water	4 (5.4)
Why was other feed besides milk given in the first 6 months?	
Children gain weight more quickly	35 (47.3)
Cry less	8 (10.8)
Sleep well	10 (13.5)
Because everybody gives it	8 (10.8)
The child was unable to take milk	12(16.2)
Don't know	1(1.4)
Colostrum was discarded	
Yes	157 (63.3)
No	91 (36.7)
Water was given in the first 6 months	
Yes	93 (37.5)
No	155 (62.5)
Practices regarding overall care of the infant	
Vaccination status of infants	
Complete	91 (36.7)
Incomplete	137 (55.2)
No	20 (8.1)
Umbilical cord care practices	
Anything applied to the umbilical stump after birth	
Yes	65 (26.2)
No	183 (73.8)
If yes, specify	
Oil	42 (64.6)
Alcohol	9 (13.8)
Spirit	7 (10.8)
Antibiotic ointment	2 (3.1)
Pyodine	1 (1.5)
Powder	1 (1.5)
Baby lotion	1 (1.5)
Baby sponge baths	1 (1.5)
Turmeric	1 (1.5)
The child was given a bath immediately after the birth	
Yes	104 (41.9)
No	144 (58.1)

Do u tightly wrap the child most of the day during the first 3 months?	
Yes	109 (44)
No	139 (56)
If yes, why?	
It helps the child to sleep	53 (21.4)
Child cries less	26 (10.5)
The child is more comfortable	18 (7.3)
Child gains weight faster	1 (0.4)
Other reasons	1 (0.4)
Don't know	1 (0.4)
Regular body massage of a child (at least thrice a week)	
Yes	216 (87.1)
No	32 (12.9)
How does massage help him?	
Sleep better	132 (61.1)
Gains weight faster	38 (17.6)
Becomes taller	25 (11.6)
Cries less	13 (6)
Remove excessive body hairs	4 (1.9)
Other reasons	1 (0.5)
Don't know	3 (1.4)
Did you try to shape the child's head?	
Yes	187 (75.4)
No	61 (24.6)
If yes, specify	
Make him sleep on a hard surface	17 (9.1)
Sleep on a special pillow	147 (78.6)
Tie a cloth around his head	23 (12.3)
How is the child put to sleep?	
On his back	117 (47.2)
On his tummy	131 (52.8)
Where does the child seep?	
Inside the cradle	36 (14.5)
Outside the cradle	212 (85.5)
Neonatal Outcomes	
Gender	
Male	117 (47.2)
Female	131 (52.8)
Status of baby birth	
Preterm	179 (72.2)
Full-term	69 (27.8)
Birth weight	
Less than 2.5kg (5.5 lbs)	62 (25)
2.5-3.5 kg (5.5-8 lbs)	143 (57.7)
More than 3.5 kg (>8 lbs)	43 (17.3)

Vaccination status	
Complete	91 (36.7)
Incomplete	137 (55.2)
No	20 (8.1)
Does the child have allergies?	
Yes	67 (27)
No	181 (73)
History of chest infection	
Yes	110 (44.4)
No	151 (60.9)
History of diarrhea	
Yes	96 (38.7)
No	151 (60.9)
Does your child cry excessively?	
Yes	66 (26.6)
No	182 (73.4)
The child started to stand at	
9 months	59 (23.8)
10 months	24 (9.7)
11 months	15 (6)
12 months	9 (3.6)
Not yet	141 (56.9)
Neck holding started at	
2 months	13 (5.2)
3 months	68 (27.4)
4 months	99 (39.9)
After 4 months	43 (17.3)
Not applicable	25 (10.1)
The child was sitting without support at	
6 months	9 (3.6)
7 months	49 (19.8)
8 months	51 (20.6)
After 8 months	32 (12.9)
Not applicable	64 (25.8)
The child was sitting with support at	
5 months	97 (39.1)
6 months	61 (24.6)
7 months	13 (5.2)
After 7 months	13 (5.2)
Not applicable	64 (25.8)

The association of maternal demographics and practices with different milestones is presented in Table 2. Delay in neck holding was significantly high in infants whose mothers discarded colostrum than those infants who were fed with colostrum (23.7% vs 11.9%) (p=0.030). Delay in neck holding and sitting was significantly high in infants who were put to sleep in a prone position (p=0.006 and p=0.023 respectively) as compared to those who slept on their back.

Table 2: Association of maternal demographics, practice and neonatal outcomes with a neck holding status and sitting with support.

	Neck holding status			Sitting without support		
	On time n(%)	Delayed n(%)	p-value	On time n(%)	Delayed n(%)	p-value
MATERNAL DEMOGRAPHICS						
Maternal education						
Illiterate	19 (73.1)	7 (26.9)	0.473	11 (61.1)	7 (38.9)	0.323
Madrassa	11 (68.8)	5 (31.3)		8 (88.9)	1 (11.1)	
Primary	32 (84.2)	6 (15.8)		19 (73.1)	7 (26.9)	
Secondary	42 (85.7)	7 (14.3)		23 (85.2)	4 (14.8)	
Graduation and above	76 (80.9)	18 (19.1)		48 (78.7)	13 (21.3)	
Maternal occupation						
Housewife	165 (80.1)	41 (19.9)	ł0.537	100 (75.8)	32 (24.2)	ł0.209
Working	15 (88.2)	2 (11.8)		9 (100)	0 (0)	
Mode of delivery						
Normal	120 (81.1)	28 (18.9)	0.835	73 (78.5)	20 (21.5)	ł0.521
Assisted	7 (87.5)	1 (12.5)		4 (100)	0 (0)	
C-section	53 (79.1)	14 (20.9)		32 (72.7)	12 (27.3)	
MATERNAL PRACTICES						
Colostrum was discarded						
Yes	106 (76.3)	33 (23.7)	*0.030	67 (74.4)	23 (25.6)	0.281
No	74 (88.1)	10 (11.9)		42 (82.4)	9 (17.6)	
Any other feed besides milk in first 6 months						
Yes	56 (82.4)	12 (17.6)	0.682	34 (68)	16 (32)	0.051
No	124 (80)	31 (20)		75 (82.4)	16 (17.6)	
How is the child put to sleep						
On his back	88 (88.9)	11 (11.1)	*0.006	59 (85.5)	10 (14.5)	*0.023
On his tummy	92 (74.2)	32 (25.8)		50 (69.4)	22 (30.6)	
Where does the child seep?						
Inside the cradle	29 (85.3)	5 (14.7)	0.462	22 (81.5)	5(18.5)	0.564
Outside the cradle	151 (79.9)	38 (20.1)		87 (76.3)	27 (23.7)	
Regular body massage of the baby						
Yes	157 (81.8)	35 (18.2)	0.321	96 (79.3)	25 (20.7)	0.161
No	23 (74.2)	8 (25.8)		13 (65)	7 (35)	
Did you usually tightly wrap the child in the first 3 months?						
Yes	78 (77.2)	23 (22.8)	0.229	54 (74.0)	19 (26.0)	0.328
No	102 (83.6)	20 (16.4)		55 (80.9)	13 (19.1)	
NEONATAL OUTCOMES						
Gender						
Male	92 (85.2)	16 (14.8)	0.101	54 (80.6)	13 (19.4)	0.375
Female	88 (76.5)	27 (23.5)		55 (74.3)	19 (25.7)	
Full-term/preterm						

Full term	131 (81.9)	29 (18.1)	0.485	86 (78.9)	23 (21.1)	0.404
Preterm	49 (77.8)	14 (22.2)		23 (71.9)	9 (28.1)	
Birth weight of the child						
Less than 2.5kg (5.5 lbs)	45 (84.9)	8 (15.1)	0.183	25 (89.3)	3 (10.7)	0.233
2.5-3.5 kg (5.5-8 lbs)	106 (82.2)	23 (17.8)		62 (73.8)	22 (26.2)	
>3.5 kg (>8 lbs)	29 (70.7)	12 (29.3)		22 (75.9)	7 (24.1)	
Vaccination status of the child						
No	12 (100)	0 (0)	0.217	0 (0)	0(0)	0.528
Complete	68 (79.1)	18 (20.9)		51 (75)	17 (25)	
Incomplete	100 (80)	25 (20)		58 (79.5)	15 (20.5)	

ŧ: Fisher's exact test was reported; *Significant at P<0.05 level

Table 3 presents the association between maternal demographics and practices with illnesses during infancy. History of allergies was high among non-immunized children (45%) (p=0.019), as compared to those who were either completely (33%) or partially vaccinated (20.4%). Birth weight was found to be associated with a history of allergies (p=0.033), with a significantly higher prevalence of allergies among low birth weight children as compared to those who had normal to high birth weight. Allergies and chest infections were more common among infants who were put to sleep in a cradle (p=0.032 and p=0.001).

Table 3: Association of maternal demographics, practices and neonatal outcomes with history of diseases.

	Does the child have allergies			History of chest infection			History of diarrhea		
	Yes n(%)	No n(%)	p-value	Yes n(%)	No n(%)	p-value	Yes n(%)	No n(%)	p-value
MATERNAL DEMOGRAPHICS									
Maternal education									
Illiterate	4 (12.9)	27 (87.1)	0.235	14 (45.2)	17 (54.8)	0.171	16 (51.6)	15 (48.4)	0.213
Madrassa	4 (22.2)	14 (77.8)		3 (16.7)	15 (83.3)		4 (22.2)	14 (77.8)	
Primary	12 (29.3)	29 (70.7)		20 (48.8)	21 (51.2)		15 (36.6)	26 (63.4)	
Secondary	19 (35.8)	34 (64.2)		23 (43.4)	30 (56.6)		24 (45.3)	29 (54.7)	
Graduation and above	28 (26.7)	77 (73.3)		50 (47.6)	55 (52.4)		37 (35.2)	68 (64.8)	
Maternal occupation									
Housewife	61 (26.4)	170 (73.6)	0.426	103 (44.6)	128 (55.4)	0.785	89 (38.5)	142 (61.5)	0.892
Working	6 (35.3)	11 (64.7)		7 (41.2)	10 (58.8)		7 (41.2)	10 (58.8)	
Delivery mode									
Normal	46 (28)	118 (72)	0.860	71 (43.3)	93 (56.7)	0.070	63 (38.4)	101 (61.6)	0.534
Assisted	2 (22.2)	7 (77.8)		1 (11.1)	8 (88.9)		2 (22.2)	7 (77.8)	
C-section	19 (25.3)	56 (74.7)		38 (50.7)	37 (49.3)		31 (41.3)	44 (58.7)	
MATERNAL PRACTICES									
Colostrum was discarded									
Yes	38 (24.2)	119 (75.8)	0.190	71 (45.2)	86 (54.8)	0.718	64 (40.8)	93 (59.2)	0.383
No	29 (31.9)	62 (68.1)		39 (42.9)	52 (57.1)		32 (35.2)	59 (64.8)	
Any other feed beside milk in first6 months									
No	43 (24.7)	131 (75.3)	0.210	71 (40.8)	103 (59.2)	0.084	71 (40.8)	103 (59.2)	0.299
Yes	24 (32.4)	50 (67.6)		39 (52.7)	35 (47.3)		25 (33.8)	49 (66.2)	

How is the child put to sleep?									
on his back	37 (31.6)	80 (68.4)	0.122	56 (47.9)	61 (52.1)	0.293	47 (40.2)	70 (59.8)	0.655
on his tummy	30 (22.9)	101 (77.1)		54 (41.2)	77 (58.8)		49 (37.7)	82 (62.6)	
Where does the child seep									
Inside the cradle	15 (41.7)	21 (58.3)	*0.032	25 (69.4)	11 (30.6)	*0.001	84 (39.6)	128 (60.4)	0.474
Outside the cradle	52 (24.5)	160 (75.5)		85 (40.1)	127 (59.9)		12 (33.3)	24 (66.7)	
Regular body massage of the baby									
Yes	61 (28.2)	155 (71.8)	0.259	98 (45.4)	118 (54.6)	0.403	86 (39.8)	130 (60.2)	0.353
No	6 (18.8)	26 (81.2)		12 (37.5)	20 (62.5)		10 (31.2)	22 (68.8)	
Do you tightly wrap the child?									
Yes	32 (29.4)	77 (70.6)	0.462	53 (48.6)	56 (51.4)	0.231	38 (34.9)	71 (65.1)	0.271
No	35 (25.2)	104 (74.8)		57 (41.0)	82 (59.0)		58 (41.7)	81 (58.3)	
NEONATAL OUTCOMES									
Gender									
Male	30 (25.6)	87 (74.4)	0.645	49 (41.9)	68 (58.1)	0.459	42 (35.9)	75 (64.1)	0.390
Female	37 (28.2)	94 (71.8)		61 (46.6)	70 (53.4)		54 (41.2)	77 (58.8)	
Full-term/preterm									
Full term	49 (27.4)	130 (72.6)	0.838	80 (44.7)	99 (55.3)	0.863	64 (35.8)	115 (64.2)	0.124
Preterm	18 (26.1)	51 (73.9)		30 (43.5)	39 (56.5)		32 (46.4)	37 (53.6)	
Birth weight of the child									
Less than 2.5kg (5.5 lbs)	21 (33.9)	41(66.1)	*0.033	31(50)	31 (50)	0.305	26 (41.9)	36 (58.1)	0.832
2.5-3.5 kg (5.5-8 lbs)	41 (28.7)	102(71.3)		64(44.8)	79 (55.2)		54 (37.8)	89 (62.2)	
>3.5 kg (>8 lbs)	5 (11.6)	38(88.4)		15(34.9)	28 (65.1)		16 (37.2)	26 (62.8)	
Vaccination status of the child									
No	9 (45)	11 (55)	*0.019	6 (30)	14 (70)	0.191	8 (40)	12 (60)	0.681
Complete	30 (33)	61 (67)		46 (50.5)	45 (49.5)		32 (35.2)	59 (64.8)	
Incomplete	28 (20.4)	109 (79.6)		58 (42.3)	79 (57.7)		56 (40.9)	81 (59.1)	

*Significant at P<0.05 level, **Significant at P<0.01 level

Discussion

Sindh, a province of Pakistan, enjoys a rich cultural heritage with specific beliefs, values, and customs. Many traditional practices have continued in urban and rural areas of Sindh for ages as in other parts of the world. Karachi, the largest city of Pakistan is a metropolitan city providing a home to people from all provinces of Pakistan. Some non-evidence-based culture and traditional practices are also commonly encountered by doctors in the healthcare of infants. A few of these traditional practices may impose a risk on the child's health to the extent of being life-threatening.

Mothers play a vital role in caring for their children; therefore their education, awareness, and household practices have an impact on the child's health and behavior [11]. Lack of formal education may compromise awareness and understanding regarding the optimum care of their infant. This has already been reported previously [12]. Although less than half of the mothers in our study were graduates, none of the practices were associated with maternal education or other socio-demographic factors such as maternal age and occupation. Yet it would be interesting to explore the association of ethnicity with traditional practices and hence risky behaviors [13].

Deliveries through an untrained birth attendant (Dai) and female family members through unsterilized equipment is still a common harmful practice in rural areas of Pakistan. Around 80% of the rural births are conducted by Dai [14]. Yet, in our study which was conducted in urban medical centers, we found more than 10th of deliveries conducted by traditional birth attendants and relatives which is indeed alarming. Preliminary studies have shown that the mode of delivery may have an impact on the health of an infant for example C-section has found to be associated with an increased risk of allergy and decrease in gut microbes [15]. This study did not find an association between

mode of delivery and allergies or infection among infants. Globally, the rate of elective C-sections has increased due to maternal requests [16,17]. and a study reported an estimated cesarean section rate in 2015 [18]. Similarly, this study also revealed a significant percentage of C- section as a mode of delivery.

The WHO and the American Academy of Pediatrics recommend exclusive breastfeeding without any supplemental feed or liquids for the first six months of age [19]. It is already known that exclusive breastfeeding for six months, started within an hour of birth, and continued for two years, prevent about eight million child deaths every year. Yet, globally, less than 40% of infants under six months of age are exclusively breastfed [20]. Maternal health, C-sections, young age mothers, full-time work, postpartum depression, and low birth weight infants with poor sucking reflex are found to be the major risk factors of early cessation of breastfeeding before six months [21]. Our study showed similar results with almost a third of the mothers, not breastfeeding.

Unawareness about the benefits of colostrum, the first milk which comes after delivery, was prevalent among mothers in this study. Traditional beliefs and misconceptions that colostrum is harmful and difficult to digest for the baby lead to mothers discarding it [22]. Interestingly, we observed an association of discarding colostrum with delayed neck holding. Previous studies have shown that the milk in the first two weeks of birth is rich in carbohydrates and micronutrients like iodine that promote cognitive as well as physical development of a child [23,24].

A novel finding was a significant association of delayed neck holding and sitting with the prone sleeping position. This is not consistent with other studies that have shown that prone position during sleep and while the child is awake, promotes neck holding and other milestones [25]. Nevertheless, a prone sleeping position is not recommended due to an increased risk of sudden infantile death syndrome (SIDS). In former studies, a supine sleeping position has been recommended until 1 year of age to reduce the risk of SIDS [26].

This study also shows a higher incidence of chest infection and allergies in infants sleeping in the cradle placing the child to sleep in a cradle especially in the prone position that may lead to SIDS. A supine sleeping position in the cradle is safer relative to co-sleeping (sharing the same bed with parents) [27]. The American Academy of Pediatrics guidelines for a safe sleep environment include using firm sleep surface, tight bedding, avoiding soft pillows, and blankets in the cradle to reduce the risk of an infant cot death [28].

Low birth weight and preterm newborns are more prone to infection and allergies [29]. Globally around 11% of infant deaths are associated with preterm and small for gestational age neonates, with an even higher incidence reported in South Asia [30]. Around one-fourth of newborns in our study, were preterm and low birth weight. The only significant association was of allergies with low birth weight in infants. One of the reasons to refuse immunization of the child is due to the belief of a higher risk of allergies with vaccinations [31]. On the contrary, we report a positive association of allergies among non-immunized children as compared to completely and partially immunized infants. This is consistent with another study that showed that vaccination may prevent allergies [32].

In Pakistan, parents and other family members are extremely concerned about their child's weight and comparison with another child is quite common. This may provoke an early introduction of solid foods in the diet before six months, hence the results of our study. This is also consistent with another study [33]. Moreover, breast milk contains 88% of water which is sufficient for the needs of the baby till six months and even with top feeding, water is only recommended in very warm weather and fever to avoid dehydration [34]. Therefore, the practice of giving water in the first six months of the child increases the chance of infections as well as water intoxication, which may cause seizures due to hyponatremia as the immature kidneys cannot excrete excessive water [35].

Some other unsafe and risky practices that should always be avoided were also being practiced by mothers in the current study. For example, giving a bath to the newborn immediately after birth may cause hypothermia [36]. Application of contaminated substances like oil, ghee, and kohl (Surma) to the umbilical cord for rapid healing may predispose the child to infantile tetanus [37]. Body massaging in infancy was first practiced in China and now practiced globally, especially in Pakistan and India. Apart from its beneficial effects, it can cause skin rashes and bacterial colonization, if not properly and hygienically done. Vigorous massage has been shown to increase the chances of fracture in the newborn [38]. The use of homeopathic medicine for easy teething is not approved by the FDA [39]. yet it was being used by a significant number of mothers in our study. Some of the licensed teething products are found to contain harmful ingredients like alcohol and lignocaine with high sugar content that can accelerate tooth decay [40]. Flathead syndrome (positional plagiocephaly) in newborns can restrict cranial growth and is associated with sleeping supine on a hard surface. This practice is also being followed by mothers to shape the head of the child [41,42].

Traditional practices are still being followed for infant care among mothers residing in urban areas of Pakistan. This study highlights the common practices of mothers and their association with infant development and health. To reduce the possibility of recall bias, only mothers of infants were invited to participate in the study. Still, there is a possibility of misreporting. This is a cross-sectional study and therefore a temporal relationship between practices and infant development and health cannot be established. Yet, this study provides a hypothesis for prospective studies to further explore and establish a causative association.

Conclusion

This study concludes that various beliefs, taboos, and behaviors are likely to affect the health and development of infants. Quite a few of these practices were not found to be based on evidence and likely to be harmful, yet observed in Pakistan. Launching culturally acceptable primary care awareness programs during the antenatal and postnatal period, imparted through trained family physicians can help reduce infantile morbidity and mortality.

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